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ER/WM&I DDT

WAD 29 WBS Element 1.1.06.19.04.03 | 97-RF-06591 | 1/5/98

Source/Driver: (Name & Number from ISP, IAG milestone, Mgmt. Action, Corres. Control, etc.)

Closure #: (Outgoing Correspondence Control #, if applicable)

Due Date

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Document Subject:

TRANSMITTAL OF THE DRAFT INTERIM MEASURES/ INTERIM REMEDIAL ACTION PLAN FOR THE 886 CLUSTER PROJECT, REVISION A - RF/RMRS-97-135 - MCB-001-98

KH-00003NS1A January 5, 1997

Discussion and/or Comments:

Please find 8 copies of the DRAFT INTERIM MEASURES/ INTERIM REMEDIAL ACTION PLAN FOR THE 886 CLUSTER PROJECT, Revision A (4 copies for Kaiser-Hill and 4 copies for DOE). This plan serves as the decision document for determining the appropriate removal action for the 886 Cluster and outlines the approach and applicable requirements that will be used in decontamination and decommissioning of the 886 Cluster.

If you have any questions regarding this document, please contact Marla Broussard at extension 6007 or Shaun Garner at extension 6588.

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Administrative Record
RMRS Records (2)

ADMIN RECORD
B886-A-00007

RF/RMRS-97-135

Rocky Mountain
Remediation Services, L.L.C.
. . . *protecting the environment*

DRAFT
INTERIM MEASURE/INTERIM REMEDIAL ACTION PLAN FOR THE 886 CLUSTER PROJECT

Rocky Mountain Remediation Services, L.L.C.

January 5, 1998

INTERIM MEASURE/ INTERIM REMEDIAL ACTION PLAN FOR THE 886 CLUSTER PROJECT

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ACRONYMS

ACE	Activity Control Envelope
AHA	Activity Hazard Analysis
ARAR	Applicable or relevant and appropriate requirements
APEN	Air Pollutant Emission Notice
CA	Contaminated Area
CCR	Colorado Code of Regulations
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
cm^2	square centimeters
CWTF	Consolidated Water Treatment Facility
dom	disintegrations per minute
DOE	Department of Energy
EDE	Effective Dose Equivalent
EPA	Environmental Protection Agency
EWP	Enhanced Work Planning
ft	foot/feet
ft^2	square feet
HEPA	High Efficiency Particulate Air
HEUN	Highly Enriched Uranyl Nitrate
HSP	Health and Safety Procedures
HASP	Health and Safety Plan
IA	Industrial Area
IM/IRA	Interim Measures/Interim Remedial Action
ISM	Integrated Safety Management
IWCP	Integrated Work Control Procedure
LDR	Land Disposal Restriction
LLW	Low-level Waste
mrem	millirem
nCi/g	nanoCurie per gram
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
PCBs	Polychlorinated biphenyls
ppm	parts per million
PU&D	Property Utilization and Disposal
QA	Quality Assurance
QC	Quality Control
RLCP	Reconnaissance Level Characterization Plan
RLCR	Reconnaissance Level Characterization Report
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RMRS	Rocky Mountain Remediation Services, L.L.C.

ACRONYMS (continued)

RFETS	Rocky Flats Environmental Technology Site
SSOC	Safe Sites of Colorado, Inc.
TBC	To-be-Considered
TRU	transuranic
TSCA	Toxic Substances Control Act
TU	Temporary Unit
WAC	Waste Acceptance Criteria
yr	year

EXECUTIVE SUMMARY

Because Building 886 and its associated facilities have no future mission, the cluster is proposed for decontamination and decommissioning to reduce operating costs and to eliminate hazards within the Cluster's buildings. Consistent with the Rocky Flats Cleanup Agreement (RFCA), the 886 Cluster Project is being conducted as a Comprehensive Environmental Response, Compensation, and Liability Act removal action. This action will be conducted as an Interim Measure/Interim Remedial Action.

This Plan serves as the Decision Document for determining the appropriate removal action for the 886 Cluster. It outlines the approach and applicable requirements that will be used in decontamination and decommissioning of the 886 Cluster. The 886 Cluster is located in the Rocky Flats Environmental Technology Site industrial area at the east central portion of the site. The buildings associated with the cluster are 886, 888, 888A, 880, 875, and T886A. The cluster also includes an outside concrete pit containing two, raschig ring tanks referred to as building 828, and an underground tunnel linking the Air Filter Plenum Building (875) with Building 886.

The findings from the reconnaissance level characterization, modified to reflect the activities to be addressed prior to commencement of decontamination and decommissioning, are summarized for each building within the 886 Cluster. The hazards are delineated in terms of physical, radiological, lead, metals, and polychlorinated biphenyls. Also listed, where appropriate, is the major equipment to be addressed. The hazards identified represent those that are anticipated at the initiation of decontamination and decommissioning. For this purpose all deactivation is assumed to have occurred.

The evaluation of the scope of work for the 886 Cluster considered the following three alternatives:

1. Alternative 1 - Decontamination and decommissioning of the 886 Cluster
2. Alternative 2 - No Action with Safe Shutdown Maintenance
3. Alternative 3 - Reuse of the 886 Cluster Facilities

The alternatives were evaluated for effectiveness, implementability and relative costs. Alternative 1 is the selected alternative. The objectives of the action are to additionally decontaminate the facilities (as necessary) to support release for decommissioning and perform the decommissioning (i.e., dismatlement, demolition, site characterization, site reclamation). To aid in the accomplishment of these objectives, the project strategy is to first divide the 886 Cluster into manageable sub-areas. Area-specific work plans will be developed, reviewed, and approved. Within the area-specific work plans, the area-specific components such as waste management, health and safety, and decontamination strategy, if necessary, will be expanded upon.

To comply with the health and safety standards specified, an integrated safety management process will be implemented. The integrated safety management process is structured around five core principles (1) define the scope of work, (2) analyze hazards, (3) develop and implement controls, (4) perform work within controls, and (5) provide feedback and continuous improvement. The process will facilitate work by identifying key hazards up front and incorporating risk management into the job planning process.

EXECUTIVE SUMMARY (continued)

The waste generated by the project will be managed by properly trained personnel in accordance with State and Federal regulations. Decontamination and decommissioning actions must attain, to the maximum extent practicable, compliance with the substantive aspects of the Federal and State applicable or relevant and appropriate requirements. The requirements relating to this proposed action are identified whether the requirement is applicable or relevant, and appropriate, or To-Be-Considered. Pursuant to RFCA ¶16, the procedural requirements to obtain federal, state, or local permits are waived as long as the substantive requirements that would have been imposed in the permit process are identified and explained (RFCA ¶17). The Plan provides discussions in a manner that satisfies the RFCA permit waiver requirements.

The National Environmental Policy Act requires that actions consider potential impacts to the environment. While no separate National Environmental Policy Act documentation is required for this effort, RFCA Department of Energy policy requires consideration of environmental impacts of the proposed action and of alternatives as part of this document. Given the existing environmental and industrial setting of the 886 Cluster, environmental impact issues associated with the proposed decontamination and decommissioning activities for the 886 Cluster are limited in scope.

The decontamination and decommissioning of the 886 Cluster will require 18 months to complete. This proposed schedule is subject to change due to regulatory and public concerns, budgetary constraints, weather delays, etc. Rocky Mountain Remediation Services and Safe Sites of Colorado have teamed to plan and manage the project. Enhanced Work Planning will serve as the management tool to implement the project and Integrated Safety Management which integrates safety into management and work practices at all levels.

Comments and questions on the Plan, submitted during the formal comment period, including those provided during the public meetings will be categorized, along with the response, in a revision to the final Interim Measures/Interim Remedial Action Plan.

1.0 INTRODUCTION

The Building 886 Cluster (Figure 1-1) is comprised of buildings 886, 888, 888A, 880, 875, T886A, and 828 and an underground tunnel with ventilation ducts that connect Building 886 to Building 875 (Figure 1-2). Because Building 886 and its associated facilities have no future mission, the cluster is proposed for decontamination and decommissioning to reduce operating costs and to eliminate hazards within the Cluster's buildings. Consistent with the Rocky Flats Cleanup Agreement (RFCA) (Department of Energy [DOE] 1996), the 886 Cluster Project is being conducted as a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) removal action. This action will be conducted as an Interim Measure/Interim Remedial Action (IM/IRA) due to the estimated time (> 6 months) from commencement of physical remedial work to completion. The 886 Cluster removal action is one of the first decommissioning activities at Rocky Flats Environmental Technology Site (RFETS) selected to meet the Site's closure goal. Deactivation, which precedes decommissioning, of the 886 Cluster was initiated in Fiscal Year (FY) 1997 with anticipated completion during calendar year 1998.

1.1 Purpose

This IM/IRA Plan serves as the Decision Document for determining the appropriate removal action for the 886 Cluster. The IM/IRA Plan outlines the approach and applicable requirements that will be used in decontamination and decommissioning of the 886 Cluster. The IM/IRA of the subject buildings will be conducted in accordance with RFCA (DOE 1996) and the applicable or relevant and appropriate requirements (ARARs) of Federal, State, and local regulations. The regulatory requirements are implemented through RFETS policies and procedures. The action will be conducted in a manner that is protective of site workers, the public, and the environment. Reconnaissance level characterization data collected and presented in the *Reconnaissance Level Characterization Report (RLCR) for the 886 Cluster Decommissioning Project* (Rocky Mountain Remediation Services [RMRS] 1997a) were used as input to the IM/IRA Plan. The characterization efforts were intended to identify the type, quantity, condition, and location of radioactive and hazardous materials which are, or which may be, present as residual contamination in the 886 Cluster facilities. Preliminary estimates of the type of contamination and safety hazards present in the 886 Cluster are summarized in the RLCR. Additional surveys, referred to as "in-process characterization," will be employed to characterize contamination, as well as physical safety hazards, throughout the decontamination and decommissioning process.

1.2 Scope

The scope of the IM/IRA includes decontamination, as necessary, of any remaining structures and decommissioning which includes dismantling and demolishing the facilities. Decommissioning also includes site characterization and reclamation activities performed subsequent to demolition. This effort will remove the 886 Clusters facilities' aboveground structures and remove or stabilize underground structures. Utilities will be capped at ground surface but not removed.

Prior to commencement of decontamination and decommissioning addressed under the IM/IRA, the following activities require completion. These activities, listed below, can in most cases be implemented in parallel. However, in other instances the activities must occur sequentially. For example, because safe decontamination and decommissioning of Building 886 will rely on the use of the Building 875 filter system, the filter plenum can not be deactivated prior to decontamination and decommissioning of specific portions of Building 886.

- Appropriate removal of all waste stored within the cluster.
- Asbestos abatement for all facilities to maximum allowable asbestos levels in accordance with Occupational Health and Safety (OSHA) and National Institute of Occupational Safety and Health (NIOSH) requirements.
- Deactivation of the assembly hood in Building 886, Room 101.
- Deactivation of the raschig rings/tanks remaining in Room 101.
- Deactivation of the downdraft unit and associated glovebox in Room 103.
- Deactivation of the annular tank in Room 101.
- Deactivation of the empty raschig ring tanks in Room 103.
- Deactivation of the process piping in Rooms 101 and 103 and pump in Room 103.
- Deactivation of the raschig rings/tank in Building 875.
- Deactivation of the raschig rings/tank in Building 828.
- Deactivation of the filter plenum in Building 875.

Figure 1-1. 886 Cluster Location at RFETS

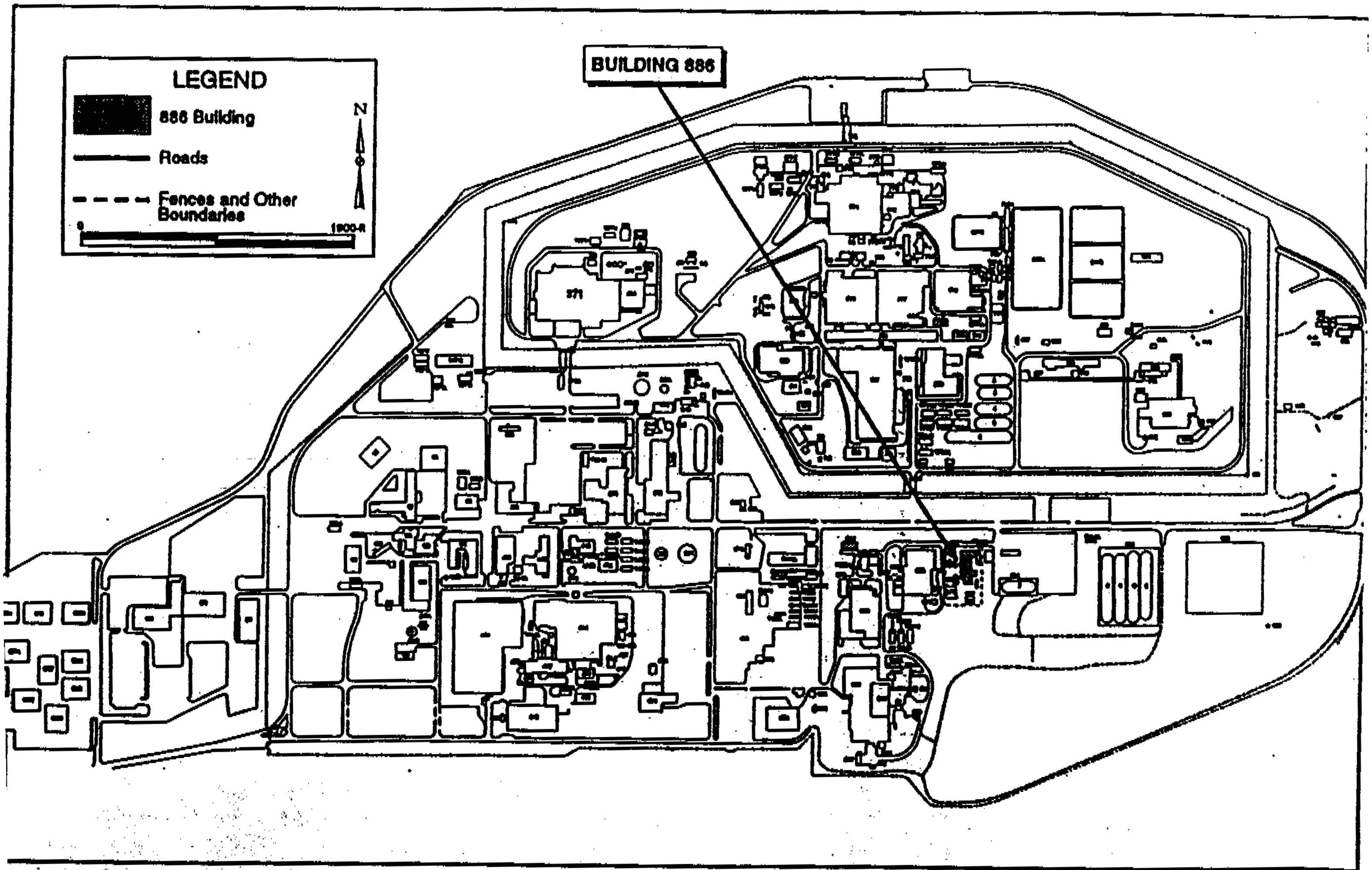
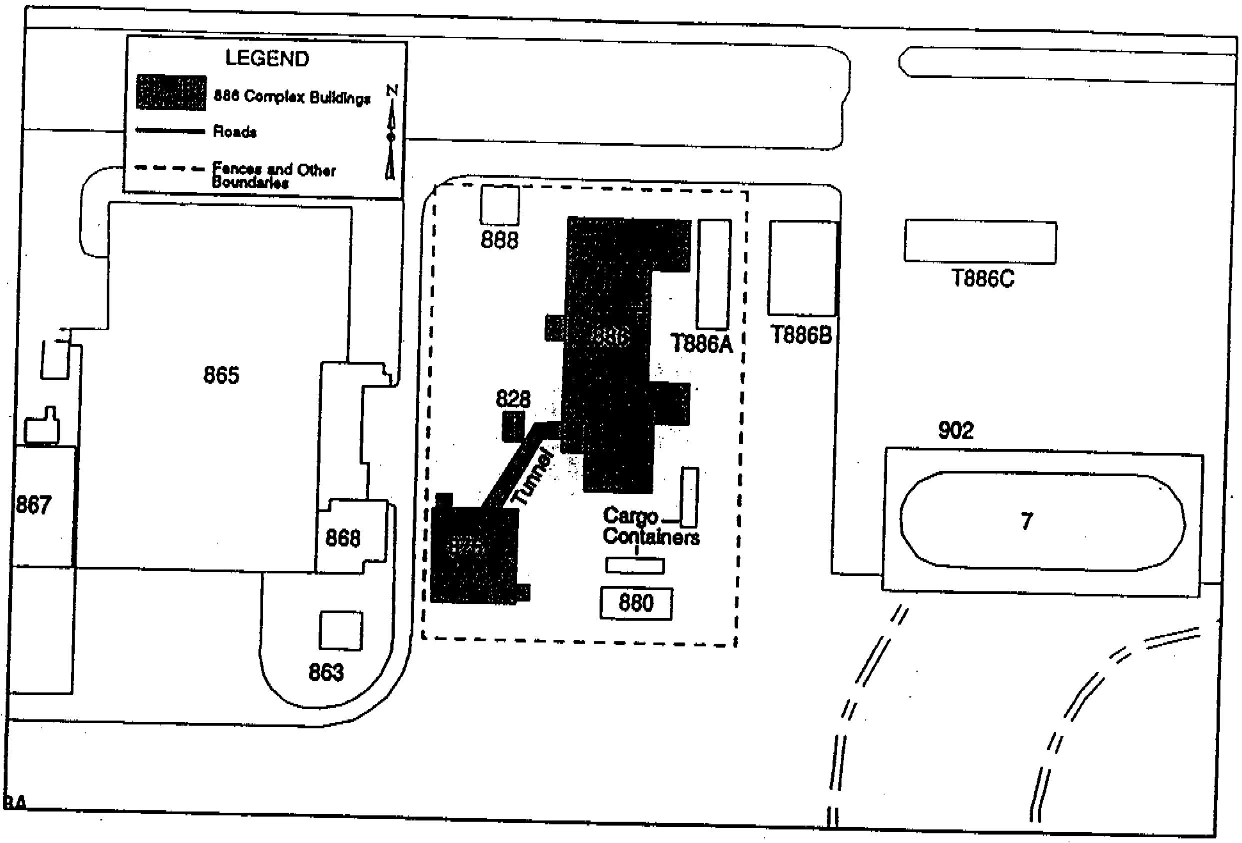


Figure 1-2. 886 Cluster



2.0 CLUSTER DESCRIPTION

The construction of Buildings 886, 875, and 888A was completed in 1964 and commissioned in 1965. The trailer T886A was located east of Building in approximately 1980; a breezeway connected the two at a later date. The construction date of Building 880 is unknown. The purpose of the 886 Cluster was to conduct criticality experiments on liquids, powder, and solid forms of fissionable materials. The date of the last criticality experiment was October 1987. These experiments were essential to validate computer models used to establish nuclear criticality safety limits, now called Criticality Safety Operating Limits.

Building 886 is not currently operational. With the exception of T886A, which is being utilized as a project support trailer, the buildings have been vacated except for two individuals who are scheduled to move. Deactivation activities were suspended in late FY 97 because resources were diverted to other efforts. The only ongoing operations are those necessary to maintain the safety envelope and comply with the Basis for Interim Operation building authorization.

There are no Resource Conservation and Recovery Act (RCRA) or CERCLA designated areas within the 886 cluster. However, the 886 Cluster Project is being conducted as a CERCLA removal action. There are no recorded instances where contamination was released to the environment; however, the potential for under building contamination at Building 886 is documented in the Historical Release Report (DOE 1992). Additionally, given groundwater seepage problems noted for Buildings 875 and 828, the potential for environmental concerns exists.

2.1 Physical Description

The 886 Cluster is located in the RFETS industrial area (IA) at the east central portion of the site. It is located just south of Central Avenue and just east of the pedestrian traffic signal. Primary construction materials used in the buildings include concrete masonry, steel, and wood with siding. The buildings associated with the cluster are 886, 888, 888A, 880, 875, and T886A. The cluster also includes an outside concrete pit containing two, raschig ring tanks referred to as building 828, and an underground tunnel linking the Air Filter Plenum Building (875) with Building 886. All the structures are single story buildings, with the exception of the criticality laboratory portion of Building 886 which is two stories high. The individual buildings are described in more detail in the following sections.

2.1.1 Building 886

Building 886 contains 10,785 square feet (ft^2), of which 4,000 ft^2 constitutes the Contaminated Area (CA). Generally, office space comprises the remaining 6,785 ft^2. The facility has no basement.

The CA is comprised of three rooms and a hallway all with slightly different construction. Room 101 (2,000 ft^2), the assembly room where all criticality experiments were performed, has 3 foot (ft) thick walls and the north wall is double reinforced concrete. The ceiling (30 ft above the floor) is also 3 ft thick. The floor is concrete and is a floating floor with respect to the walls. Room 102 (600 ft^2), a storage vault, was constructed in the middle 1970's to meet DOE requirements for Special Nuclear Material vaults. The walls are double reinforced concrete with a cast integral concrete roof. Room 103 (900 ft^2), the mixing room, is a fissile solution storage area; it has 3 walls that are reinforced concrete with the west wall constructed of cinder blocks with rebar. The roof is sheet metal with an overlay of tar. Approximately half of the Room 103 floor area is two to four ft below the building's floor level.

There reportedly have been five incidents where uranyl nitrate was spilled onto the floor of the CA. The largest spill involved between 50 and 60 gallons of solution. The laboratory floors are sealed and bermed to contain such spills and the solution was recovered for further use. None of these incidents resulted in solution escape from the building. In the late 1960's, an accumulation of uranyl nitrate salt was found inside the base of the ventilation system filter plenum outside of Building 886. This accumulation, about one ft square and one-quarter inch thick, is thought to have resulted from an incident in which some solution overflowed into a vent line and dried, with subsequent air flow over the vent carrying the salt to the filter plenum.

The area outside the CA is comprised of offices, the building entryway, hallways, a utility room (Room 111) and control room (Room 112). The office space is slab on grade and the walls are cinder block with a built-up roof.

2.1.2 Building 888A

Building 888A (400 ft^2) is an electrical substation for the cluster buildings.

2.1.3 Building 880

Building 880 (800 ft^2) is a metal "Butler" type building 100 feet south of Building 886. Prior to deactivation (Section 1.2), Building 880 stored several items of used experimental equipment awaiting anticipated disposal. Some of the items may be slightly contaminated with highly enriched uranyl nitrate (HEUN).

2.1.4 Building T886A

Building T886A (1,960 ft^2) is an office trailer connected to the northeast corner of Building 886. It will continue to serve as office space during project execution and is of standard trailer construction.

2.1.5 Building 875

Building 875 (3,900 ft^2) is a filter plenum building containing the filters for the Building 886 exhaust system. Considered part of this facility is the tunnel and duct work within the tunnel to Building 886. The duct work in the tunnel and the plenum has HEUN (low level) contamination.

2.1.6 Building 828

Building 828 is 170 ft^2 outside concrete pit containing two, raschig-ring tanks that have never been used for their intended purpose. However, one of the tanks has been used to hold groundwater that has seeped into the pit.

2.1.7 Building 888

The guard shack (Building 888) located north of Building 888A was not originally included in the 886 Cluster; however, given that its function is associated with that of the 886 Cluster, the building has been considered in the IM/IRA Plan.

2.2 Reconnaissance Level Characterization Summary

The reconnaissance level characterization of the Building 886 Cluster included a review of historical records and the collection of process knowledge information covering the operational time period for the facility from original construction to present. This information was evaluated to identify data needs for the characterization effort (RMRS, 1997a). As part of the characterization, comprehensive, physical inspections of all accessible areas of the 886 Cluster were performed. The primary purpose of these inspections were:

- confirm the accuracy of file documentation of as-built or modified facility construction, equipment installations, and general facility conditions;
- obtain volume estimates for wastes that will be generated during removal activities;
- identify equipment, structures, process lines, and associated items that will require hazardous and/or radioactive surveys and analytical sampling to further characterize the cluster;
- identify potential sources of lead and asbestos;
- identify potential chemical contamination;
- identify physical hazards;
- locate, identify, and document any facility condition or problem situation which had not been previously identified or otherwise documented in appropriate building records or files; and
- identify equipment, structures, process lines, and associated items which require field surveys and/or analytical sampling for the purpose of characterizing the cluster for radioactive and hazardous contaminants.

As indicated above, the characterization included the identification of potential sources of chemical contamination. To accomplish this, the characterization effort also involved the development and execution of a *Reconnaissance Level Characterization Plan (RLCP) for the 886 Decommissioning Project* (RMRS 1997b). The characterization strategy was based on the data needs identified in the RLCP from a data quality objective development process. The RLCP identified potential contaminants of concern for the cluster facilities and delineated a sampling program to characterize their occurrence. The contaminants of concern identified in the RLCP were radiological, asbestos, polychlorinated biphenyls (PCBs), lead, and other metals. The plan, and sampling and analysis protocols contained therein, was reviewed and approved. Radiological contamination was sufficiently characterized by process knowledge and existing surveys. As a result, additional radiological characterization was not required per the RLCP.

The findings from the reconnaissance level characterization, modified to reflect the activities to be addressed prior to commencement of decontamination and decommissioning (Section 1.2), are summarized for each building within the 886 Cluster and presented in Tables 2-1 through 2-6. The hazards are delineated in terms of physical, radiological, lead and metals, and PCBs. Also listed, where appropriate, is the major equipment to be addressed (RMRS 1997a). The hazards identified represent those that are anticipated at the initiation of decontamination and decommissioning. For this purpose all deactivation and activities identified in Section 1.2 are assumed to have occurred.

Table 2-1. Hazards - Building 886[1].

Room	Physical	Radiological	Lead and metals	PCBs	Electrical	Other/Equipment
101	Elevated Platform Overhead equipment Overhead crane Fall potential	CA; Fixed contamination. Trace decay products	Paint	Purple paint from HEUN lines; Green paint on electrical boxes; hexane swipe from hydraulic pump for the horizontal split table	Conduit function boxes and control wire	Deactivated: Raschig ring tanks SCRAM tanks Annular tank Piping Walk-in hood Horizontal split table Vertical split table Solution base Water reflector apparatus Elevated Platform Concrete Reflector Pads (8) Hydraulic unit (1) Solution transfer pump (4)
102	None	CA ; Fixed contamination in floor	Paint	None	None	None
103	Ladder Protruding pipes and valves	CA; Fixed contamination Trace decay products	Paint	Purple paint from HEUN lines; Green paint from electrical utility boxes	Junction boxes, wiring, conduit	Deactivated: Solution pumps (2) Piping Stainless steel tanks (11) Glovebox type enclosure (2) Hydraulic unit (2)
108	None	CA; Fixed contamination	Paint	Green paint from electrical utility boxes	Junction boxes, wiring, conduit, security alarm	None
110	None	None	Paint	None	Conduit	None
111	Sharp edges Sharp corners Protruding pieces of equipment, pipes valves	None	Paint	Green paint from electrical boxes; Gasket material from vibrator damper >50 parts per million (ppm)	Equipment, electrical panels-480 kV; Criticality panel	Deactivated: Ventilation ductwork Air compressor (2)
112	Control boxes Sheet metal Sharp edges	None	Paint Circuit boards	None	Control boxes, electrical panels-480 kV	Reactor control console
All other	Sheet metal with sharp edges	None	Paint	None	Wiring in walls	Security Fire alarm One cylinder compressed nitrogen gas

[1]Building 886 has a built up roof system that was specified as containing asbestos in the felt and tar. As such, the roof is assumed to be asbestos containing without the need of sampling. Tar impregnated roofing felts may be disposed of with normal demolition debris under most circumstances.

Table 2-2. Hazards - Building 888A.

Physical	Radiological	Lead and Metals	PCBs	Electrical	Other/Equipment
Razor Wire	None	None	None	13.8 kilovolt Substation	None

Table 2-3. Hazards - Building 880.

Physical	Radiological	Lead and Metals	PCBs	Electrical	Other/Equipment
Trip and fall; protruding edges	None	None	None	None	None

Table 2-4. Hazards - Building T886A.

Physical	Radiological	Lead and Metals	PCBs	Electrical	Other/Equipment
None	None	None	None	None	None

Table 2-5. Hazards - Building 875.

Physical	Radiological	Lead and Metals	PCBs	Electrical	Other/Equipment
Noise; Sharp protruding edges	CA	Paint	None	Equipment; electrical panels 480 Volt	Deactivated: Filter plenum Raschig rings tank Fire control panel; fire suppression system

Table 2-6. Hazards - Building 828.

Physical	Radiological	Lead and Metals	PCBs	Electrical	Other/Equipment
Confined space; fall; protruding pipes and valves, slips, spiders	Potential from groundwater seepage.	None	None	None	Deactivated: Pumps (electric motors) Raschig ring tank

3.0 ALTERNATIVE ANALYSIS

Several alternatives were considered for the near-term management of the 886 Cluster. The preamble to RFCA and the RFETS' Vision statement both contain the objective that buildings will be decontaminated as required for future use or demolition. The evaluation of the scope of work for the 886 Cluster considered the following three alternatives:

1. Alternative 1 - Decontamination and decommissioning of the 886 Cluster
2. Alternative 2 - No Action with Safe Shutdown Maintenance
3. Alternative 3 - Reuse of the 886 Cluster Facilities

The alternatives were evaluated for effectiveness, implementability and relative costs. The results of the alternative analysis are summarized in Table 3-1. Alternative 1 is the selected alternative. Decontamination and decommissioning of the 886 Cluster clearly supports the RFETS' vision of safe, accelerated, and cost-effective closure. The alternative has the lowest-life cycle costs, achieves risk-reduction the fastest, and is integrated with the operations of the Site. This alternative also maintains long-term protectiveness of public health and the environment. Short-term impacts to the environment (i.e., impacts during the duration of the action) can be physically and administratively controlled. There are no significant negative aspects to decontamination and decommissioning of the cluster at this time.

Alternative 2, No Action with Safe Shutdown Maintenance, does not immediately achieve the RFETS' goals. The alternative does not accomplish accelerated closure and defers decontamination and decommissioning. This results in an increase in the life-cycle cost of closure. The short-term protectiveness of human health and the environment is achieved by inaction. However, the protectiveness of Alternative 2 is only achieved until the time the cluster is decommissioned. Waste and debris requiring treatment and/or disposal, and the risks associated with managing them are not eliminated from the cluster closure under this alternative.

Alternative 3 is not feasible as evident in evaluations indicated reuse of the 886 Cluster is not required or beneficial. As with Alternative 2, implementation of this action will result in the deferral, not elimination, of eventual decontamination and decommissioning of the cluster is necessary to achieve the RFETS' vision.

Table 3-1. Alternative Analysis Summary (continued).

Alternative	Description	Effectiveness	Implementability	Relative Cost
1 – Decontamination and Decommissioning	Decontamination and decommissioning activities will follow area-specific plans approved by the DOE and Colorado Department of Health and Environment (CDPHE). Activities consist of : Additional decontamination (i.e., post-deactivation) as deemed necessary; decommissioning to include dismantlement, demolition, site characterization, and site reclamation; waste generation. Any remediation waste generated by decommissioning would be transported to an appropriate facility for storage followed by disposal.	Decontamination and decommissioning is effective in achieving the long-term goals of RFCA by not only decontaminating the buildings but also demolishing the aboveground structures to grade and removing or stabilizing underground structures. The mortgage costs of the cluster are eliminated and the risk remaining following the action will be significantly lower than the risk that exists under the current condition.	Technology currently exists to achieve the objectives of this alternative both technically and administratively. Integration with other site activities (e.g., waste storage capacity) can be accomplished.	Decontamination and decommissioning has the lowest life-cycle cost due to the fact that ultimately the 886 Cluster must go through decommissioning and incorporate this cost into its baseline. Once decommissioning is achieved, only minimal landlord costs will be needed.
2 – No Action with Safe Shutdown Maintenance	No action will maintain the 886 Cluster facilities in their current configuration. No additional equipment would be removed unless the present safe shutdown status of the facility became compromised.	No action will delay decommissioning activities that must eventually be performed to meet the goals of RFCA. The alternative is effective in achieving the near-term goal identified in the RFCA preamble. Deferring the decommissioning of the 886 Cluster could make funding available to other removals. Long-term goals could be jeopardized if the structural integrity of the mothballed buildings increases risk to workers and the environment.	Administratively, this alternative is not ideally implementable because the integrated sitewide baseline has planned for the decommissioning of the 886 Cluster to occur early in the Site closure. No Action would cause a disruption to the long-term plans for RFETS.	No action would have the life-cycle costs of decommissioning (adjusted for future value) in addition to landlord/surveillance costs necessary to maintain a mothballed facility (structural continuity, fire prevention, etc.) until demolition occurs.

Table 3-1. Alternative Analysis Summary.

Alternative	Description	Effectiveness	Implementability	Relative Cost
3- Reuse	Reuse of the 886 Cluster would keep the facilities in their current configuration. A new mission for the facilities, in support of the present Site Cleanup Mission, would be assigned by the Site Utilization Review Board. Depending on the nature of the new mission, additional removal of equipment may be necessary. The current configuration utilities and equipment would be maintained until a new 886 Cluster mission was defined	Reuse of the 886 cluster was evaluated by the Sites Facilities Use Committee and it was determined that there was not further mission for the 886 Cluster. Use of the 886 Cluster for an alternative off-site use was evaluated in accordance with DOE Order 4300.1C, *Subparagraph g, Disposal of* Government-Owned Land improvements. No future use was identified through this evaluation.	Because no new mission has *been identified for the 886* Cluster, and because the site-wide integrated baseline has identified the decommissioning of this area in the near future, implementing this alternative is not administratively feasible.	This alternative could result in the greatest life-cycle costs if the reuse mission requires the expenditure for modifications to the buildings in addition to landlord/ surveillance costs and then the decommissioning costs (adjusted for future value) once the mission has expired and the buildings are demolished.

4.0 PROJECT APPROACH

Decontamination and decommissioning was selected as the preferred alternative for the 886 Cluster as discussed in the alternative analysis (Section 3.0). The objectives of the action are to additionally decontaminate the facilities (as necessary) to support release for decommissioning and perform the decommissioning (i.e., dismatlement, demolition, site characterization, site reclamation). To aid in the accomplishment of these objectives, the project strategy is to first divide the 886 Cluster into manageable sub-areas. The need for this strategy is demonstrated by the findings from the reconnaissance level characterization. As summarized in Section 2.0, it is evident that the hazards identified for each of the facilities within the 886 Cluster are diverse (i.e., some facilities or portions thereof will require minimal effort to decommission while others will require extensive preparation before decommissioning activities can proceed). Decommissioning of some buildings can be easily addressed as an aggregate or "area." By implementing an area-specific approach, the decontamination and decommissioning processes unique to each area can be more directly addressed. The following areas within the 886 Cluster have been identified:

- Building 886 – CA
- Building 886 – non-CA
- Buildings 875 and tunnel
- Buildings 880, 828, 888
- Building 888A
- Building T886A

Area-specific work plans will be developed, reviewed, and approved. Within the area-specific work plans, the area-specific components such as waste management, health and safety, and decontamination strategy, if necessary, will be expanded upon.

4.1 Proposed Action Objectives

The objectives of the action are to:

- decontaminate the facilities (as necessary) to support release for decommissioning;
- dismantle and demolish the 886 Cluster facilities in accordance with RFCA and ARARs;
- characterize potentially affected soils (i.e., those under building foundations, adjacent to and under subsurface structures) and remediate (as necessary) in accordance with RFCA and ARARs;
- reclaim the site by re-contouring and re-vegetation; and
- complete the decontamination and decommissioning activities in a manner that is protective of site workers, the public, and the environment

The proposed action objectives are expressed in terms of release criteria, decontamination options to be considered during area-specific work plan development, and decommissioning activities to be delineated in the area-specific work plans. Each of these elements is discussed in the following sections.

4.1.1 Release Criteria

Release criteria will be used to guide the additional (i.e., post-deactivation) decontamination and decommissioning activities. Release criteria, by contaminant, and application in relation to decontamination and decommissioning are discussed in the following sections.

4.1.1.1 Radionuclides - Table 4-1 summarizes the unrestricted release criteria for specific, residual, surface contamination levels expressed in terms disintegrations per minute (dpm) per 100 square centimeters (cm^2). These criteria have been agreed to by CDPHE, the Lead Regulatory Agency, in lieu of other standards. These accepted industry standards for the release of materials are identified in "Radiation Protection of the Public and Environment", DOE Order 5400.5 as referenced in RFCA, Termination of Operating Licenses for Nuclear Reactors, Nuclear Regulatory Commission (NRC) Regulatory Guide 1.86 (NRC 1986), and the Health and Safety Practice Transfer and Unrestricted Release of Property and Waste, P73-HSP-1810 Appendix 1. All equipment or material not meeting the applicable unrestricted release criteria (Table 4-1) will either be decontaminated to the applicable standard or disposed as radioactive waste.

Table 4-1. Summary of Unrestricted Release Activities (NRC 1986).

Radionuclide	Average Total (Fixed + Removable) Contamination ($dpm/100cm^2$)	Maximum Total (Fixed + Removable) Contamination ($dpm/100cm^2$)	Removable Contamination ($dpm/100cm^2$)
Transuranic: Ra^{-226}, Ra^{-228}, Th^{-228}, Pa^{-231}, Ac^{-227}, I^{-125}, I^{-129}	100	300	20
Th-Natural: Th^{-232}, Sr^{-90}, Ra^{-223}, Ra^{-224}, U^{-232}, I^{-131}, I^{-133}	1,000	3,000	200
U-Natural: U^{-235}, U^{-238}, and associated decay products, alpha emitters	5,000	15,000	1,000
Beta-gamma emitters (radionuclides with decay modes other than the alpha emission or spontaneous fission) except Sr^{-90} and others noted above.	5,000	15,000	1,000

4.1.1.2 Polychlorinated biphenyls - The sources of PCBs identified during reconnaissance level characterization are one gasket in Building 886 Room 111, fluorescent light ballasts, purple (light and dark) paint from HEUN lines, green paint with brownish/red base coat on electrical utility boxes, and potentially oil in the hydraulic pump for the horizontal split table in Building 886, Room 101. Human exposure to PCBs is regulated by OSHA to minimize worker exposure. With respect to waste generation, all materials >50 ppm PCBs will be managed as Toxic Substances Control Act (TSCA)-regulated.

4.1.1.3 Lead and Metals - Painted surfaces are the primary source of lead and/or metals contamination in the 886 Cluster facilities. Based on radiological evaluation, lead and metals paint-contaminated debris that is characterized as industrial waste will be release to either an approved low-level waste (LLW) treatment facility or a sanitary landfill. Additionally, RCRA potentially applies to the waste generated. Waste streams that exceeds the toxicity characteristic

The level of lead toxicity is related to the age of the exposed individual and circumstances of exposure. The primary exposure routes are ingestion and inhalation. OSHA guidelines minimize worker exposure to lead and metals.

4.1.2 Decontamination Options

Because significant decontamination was conducted as part of deactivation, the need for decontamination will be identified for each area of the cluster during work plan development. The area-specific work plans will delineate the decontamination technology, or combinations thereof, to be implemented if additional decontamination is deemed necessary. Decontamination options to be considered for each area and associated technologies and general descriptions are illustrated in Figure 4-1. The technologies to be considered have been selected from the *DOE Decommissioning Handbook* (DOE 1994) and highlighted for other RFETS decommissioning activities. The implementation of a specific technology or combination of technologies will be through Integrated Work Control Procedures (IWCP) to be developed along with the area-specific work plans.

4.1.3 Decommissioning

For the purposes of the IM/IRA Plan, decommissioning has been defined to include dismantlement, demolition, site characterization, and site reclamation. As discussed in Section 4.1, the hazards identified for each of the facilities within the 886 Cluster are diverse. Area-specific approaches, as developed in the area-specific work plans, will be implemented. This allows decommissioning activities unique to each area to be more directly addressed. The following sections address general scope of decommissioning activities.

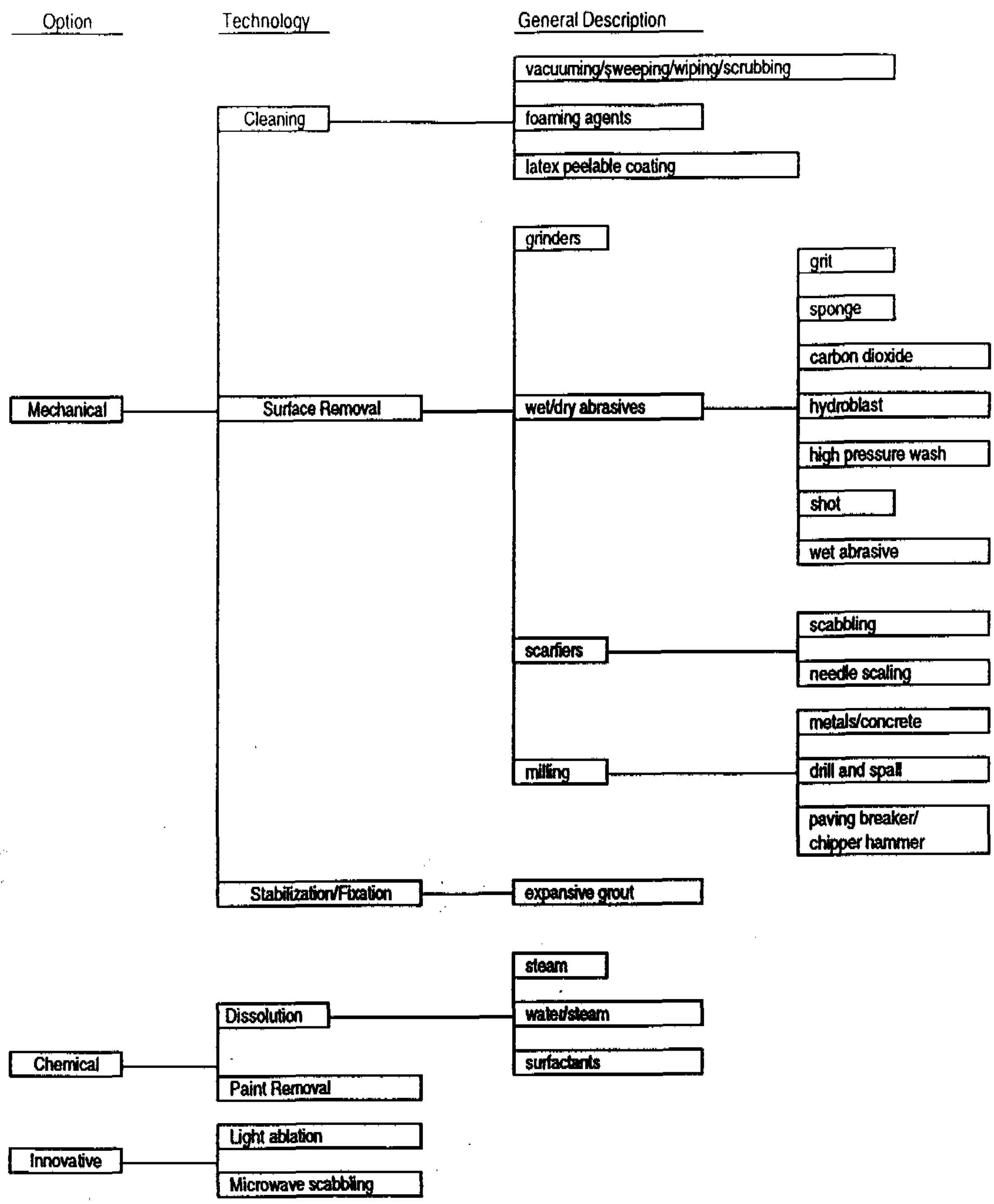
4.1.3.1 Dismantlement - Dismantlement encompasses eliminating the physical and electrical hazards associated with the facility in preparation for demolition. Equipment will be dismantled in place and packaged and surveyed for disposition , work areas will be de-energized, and pipes, pumps, tanks will be disassembled. Mechanical (e.g., wall and floor sawing, cutters) or thermal (e.g., flame cutting, arc cutting) dismantling techniques may be employed. All utilities and electrified system that are not necessary to maintain a safe working environment during dismantlement will be disconnected and capped. Cable and wiring of such systems will be removed. Piping systems in rooms or work areas disassembled.

4.1.3.2 Demolition - Demolition will remove the 886 Cluster facilities' aboveground and underground structures. These structures will likely be demolished using mechanical techniques accomplished using mobile demolition equipment. Building foundations will be removed to grade and underground utilities will be capped at grade. If removal of the underground structures is performed (i.e., the tunnel and pit at Building 875 and Building 828 pit), their demolition will likely require the use of excavation equipment. Additionally, equipment such as excavators equipped with a shear and/or a bucket, bucket loaders and dump trucks will also be used. Salvageable material will be separated from the demolition rubble.

4.1.3.3 Site Characterization – Demolition activities will potentially expose contaminated soils. Soils under building foundations (i.e., potential under building contamination associated with 886) and adjacent to and under subsurface structures are potentially contaminated. Under these circumstances soil will be sampled to assess the potential for contamination. Sampling and Analysis Plans will be developed and included in the appropriate area-specific work plan (i.e., Buildings 875, 828). Results will be compared to RFCA action levels.

4.1.3.4 Site reclamation - Site reclamation consists of backfilling the areas of sub-grade demolition, re-grading and replacement of topsoil, and re-vegetation of all disturbed areas in accordance with the guidance provided by ecologists.

Figure 4-1. Decontamination Options and Technologies.



5.0 HEALTH AND SAFETY

The 886 Cluster Project falls under the scope of the OSHA construction standards for Hazardous Waste Operations and Emergency Response, 29 CFR 1910.120 and 1926. Under these standards, a Site-Specific Health and Safety Plan (HASP) has been prepared to address the safety and health hazards of each phase of operations and specify the requirements and procedures for employee protection (RMRS et al., 1997). In addition, the DOE Order for Construction Project Safety and Health Management, 5480.9A, applies to this project. This order requires the preparation of Activity Hazard Analyses (AHAs) to identify each task, the hazards associated with each task, and the precautions necessary to mitigate the hazards.

To comply with the health and safety standards specified, an ISM process will be implemented. The ISM process is structured around five core principles (1) define the scope of work, (2) analyze hazards, (3) develop and implement controls, (4) perform work within controls, and (5) provide feedback and continuous improvement. The process will facilitate work by identifying key hazards up front and incorporating risk management into the job planning process.

The objectives of the ISM and HASP are to:

- Protect the employees, co-located workers, the public and environment from hazards during decontamination ad decommissioning.

- Ensure appropriate safety management is administered throughout decontamination and decommissioning.

- Develop and maintain a high level of health and safety awareness that is practiced by all levels of management, supervision, and employees.

- Meet the goal of zero lost time accidents for the entire decontamination and decommissioning process.

- Foster excellent safety communications between all Site work groups that are affected by the decontamination and decommissioning of the 886 Cluster to ensure the intent and goals of RFCA are met.

- Train project personnel so they are capable of completing assigned tasks safely and in compliance with the applicable environmental and safety regulations.

6.0 WASTE MANAGEMENT

A revised *Building 886 Deactivation, Decontamination, and Decommissioning Waste Management Project Plan* (Safe Sites of Colorado [SSOC] et al., 1997) is being developed following DOE guidance and is intended to augment this IM/IRA Plan. The waste generated by the project will be managed by properly trained personnel in accordance with State and Federal regulations. The RFETS Waste Operations organization will arrange for transportation to an appropriate off-site facility. Manifests will be the responsibility of RFETS Traffic Department. Waste management training requirements are outlined in Part IX Personnel Training of the RFETS RCRA Permit (DOE 1997a). The training matrix defined in Part IX details the training requirements for all personnel managing hazardous waste. Although the document is part of a permit, all RCRA training requirements of 6 CCR 1007-3, 265.16 are met (SSOC et al., 1997).

The overall strategy for managing waste resulting from the decontamination and decommissioning of the 886 Cluster is to evaluate the generation and waste management on an area-specific basis. In general, waste materials will be sorted at the time of removal and prepared for further decontamination, survey, recycle, processing and packaging in another area of the 886 Cluster, away from the point of generation. The existing RFETS Waste Management Program and procedures will be used as guidance to ensure the waste has been generated, packaged, and surveyed to meet the final disposal facility's Waste Acceptance Criteria (WAC).

Waste types which will result from the decontamination and decommissioning of the 886 Cluster include radioactive, mixed, hazardous, toxic, and sanitary (i.e., industrial) waste. Preliminary estimates of waste type and volume, as provided in the RLCR, are shown in Table 6-1 (RMRS 1997a). These estimates will be refined, on an area-specific basis, in the area-specific work plans. All waste generated as a result of decontamination and decommissioning activities will be managed in accordance with relevant RFETS waste operations procedures as guidance. State and federal regulations and DOE Orders have been incorporated into the RFETS waste operations procedures. The 886 Waste Management Plan provides the detail associated with characterization, storage, disposal, and overall waste management for the 886 Cluster. Area-specific considerations with respect to waste management will be included in the area-specific work plans developed for the project.

Table 6-1. Preliminary Estimates of Waste for the 886 Cluster Project.

Type of Waste	Primary Matrix	Quantity (cubic meters)	Type of Waste Package	Quantity of Waste Package
Low-level	Paper/Glass/Plastic/Metal(i.e., Pipe)/Rubble	225	Standard Crate	75
Low-level	Metal (i.e., tanks)		Custom Crate	
Low-level Mixed	Plastic/Pipe	3	Standard Crate	1
Transuranic (TRU)	None	0	N/A	N/A
TRU Mixed	None	0	N/A	N/A
Hazardous/TSCA	Painted materials	3	Standard Crate	1
Sanitary	Rubble	1,000	Bulk	N/A

6.1 Waste Type

6.1.1 Low-level Waste

LLW is defined as radioactive waste that is not classified as TRU waste, spent nuclear fuel, or by-product material as identified in DOE Order 5820.2A, Radioactive Waste Management. LLW contains less than 100 nanoCuries per gram (nCi/g) TRU radioactivity. Based on economical and technical constraints, items will be decontaminated to unrestricted release conditions whenever possible (Table 4-1). Items that have been decontaminated to an unrestricted release condition will be transferred for use at a different location within RFETS, for use at a different DOE facility, or sent to the Property Utilization and Disposal (PU&D) organization for appropriate disposition. Only materials that meet recycle/reuse criteria identified in the Property Management Manual will be sent to PU&D. As appropriate, low-level and low-level mixed waste will be generated, characterized, and packaged in accordance with the RFETS low-level Waste Management Plan.

6.1.2 Mixed Waste

At RFETS, mixed waste is defined as RCRA hazardous waste containing measurable amounts of radioactive isotopes. Mixed waste is characterized as either low-level or TRU based on the amount of radioactivity at the time of assay. Mixed waste generated from decontamination and decommissioning activities will be stored in temporary units prior to shipment to an approved, off-Site disposal facility. It is anticipated that only low-level mixed waste will be generated from the IM/IRA.

6.1.3 Hazardous Waste

Hazardous waste is defined as waste that is listed or exhibits the characteristics of corrosivity, ignitability, reactivity, toxicity or that is listed in 6 CCR 1007-3, Part 261, or 40 CFR 261, Subpart D. It is anticipated that lead and metals contaminated waste will be generated from the IM/IRA.

6.1.4 Toxic Substances Control Act Waste

TSCA addresses all chemical substances manufactured or processed in or for the United States. A chemical substance is defined in broad terms as any organic or inorganic substance of a particular identity including those substances identified in 15 CFR, Paragraph 2602(2)(A)(i-vi) and which may present unreasonable risk or injury to health and the environment. Of particular significance to the 886 Cluster are PCBs as regulated under 40 CFR 761. With the exception of the potential for PCBs in light ballasts, the PCB-containing materials identified in the cluster are a gasket in Building 886, Room 111, purple (light and dark) paint from HEUN lines, green paint with brownish/red base coat on electrical utility boxes, and potentially oil in the hydraulic pump for the horizontal split table in Building 886, Room 101. Waste generated from decontamination and decommissioning of these materials will be handled as TSCA waste. With respect to the light ballasts, light ballasts marked "No PCBs" or "PCB free" will be managed as solid waste and disposed at a sanitary landfill. Ballasts marked "PCBs" or not marked and not leaking will be packaged for disposal at a TSCA-permitted facility. Leaking PCB light ballasts and unmarked light ballasts will be managed as fully-regulated PCB articles.

6.1.5 Sanitary Waste

Industrial waste is characterized as that waste which meets RCRA Subtitle D requirements. Industrial waste will be generated as a result of the 886 Cluster. This waste will be managed in accordance with Colorado rules and regulations.

6.2 Waste Minimization

Waste minimization will be integrated into the planning and management of the 886 Cluster decontamination and decommissioning wastes. Project management and staff will incorporate waste minimization practices into work procedures. Minimizing generation of radioactive and mixed waste will be controlled by using work techniques that prevent the unnecessary contamination of areas and equipment, preventing unnecessary packaging, tools, and equipment when practical. Waste minimization will be accomplished using a waste life cycle cost approach. If the cost to demonstrate that the item is not contaminated exceeds the cost for waste disposal, the item will be disposed of as waste in accordance with the Property Management Manual, 1-MAN-009-PMM. The evaluation may include disassembly, decontamination, and survey costs. Elimination and reduction of waste generated as a result of decontamination and decommissioning is high priority. Decontamination options will be evaluated for waste minimization potential and suitable minimization techniques will be implemented. Most of the bulk building structural material is expected to be free released and will be removed from the Site for recycle or disposal as appropriate.

6.3 Waste Characterization

The overall approach to waste characterization is described in the Waste Management Plan for the 886 Project (SSOC et al., 1997). Data collected in support of the reconnaissance level characterization and in-process characterization will be used to estimate the type and volume of waste to be generated. Preliminary waste volume estimates are provided in Table 5-1. The area-specific work plans will include volume estimates applicable to the corresponding area.

6.4 RCRA Units

There are no RCRA units located in the 886 Cluster facilities. The project will not establish any RCRA permitted waste storage units within the 886 Cluster. Hazardous remediation waste will be managed in temporary units (TUs) on plant site until final dispositioning. The establishment of TUs may require a permit exemption because it is anticipated that the tanks or containers will be used for longer than 90 days.

6.5 Idle Equipment

Presently, hazardous materials contained in idle equipment are processed by building operations personnel in compliance with the Management Plan for Material Contained in Idle Equipment, 94-MP/IE-0017. Hazardous materials contained in idle equipment in the 886 Cluster have been identified for dispositioning during deactivation. Remaining idle equipment will be managed in accordance with the Idle Equipment Consent Order during decontamination and decommissioning and residual wastes will be considered remediation wastes. These items are included, on a building specific basis, in Tables 2-1 through 2-6.

6.6 Off-Site Release of Wastes and Applicability

Remediation wastes are not exempt from the Land Disposal Restriction (LDR) standards when they are transferred off-site for disposal. As a result these wastes must meet all applicable LDR standards when transferred off-Site for disposal.

In addition, the facility accepting CERCLA wastes must meet the requirements of the final Off-Site Rule (58 CFR 49200). The primary purpose of the Off-Site Rule is to clarify and codify CERCLA's requirement to prevent wastes generated from remediation activities conducted under CERLCA from contributing to present or future environmental problems at off-Site waste management facilities. Only facilities that meet Environmental Protection Agency's (EPA) acceptability criteria can be used for off-Site management of CERLCA wastes. The Off-Site Rule applies to both hazardous and non-hazardous wastes generated from remedial and removal actions funded or authorized, by CERCLA.

Release of non-contaminated material, debris, and equipment from a site contaminated with hazardous materials is accomplished by:

- demonstrating the materials or waste do not exhibit any of the characteristics of hazardous waste, and are not listed hazardous waste, as identified in Subpart C of 6 CCR 1007-3 Part 261 or are excluded under the provision in 40 CFR 268, Subpart D, and

- the off-site waste management facility meets the requirements of the CERCLA Off-Site Rule.

Process knowledge and operating history related to the facilities can also be used to segregate hazardous contaminant areas from unaffected areas. Further sampling and analysis of wastes may be required during the project to determine if the wastes are regulated as LDR, or if the wastes can be exempted under the hazardous debris rule. LDR requirements are integrated into RFETS waste and characterization procedures to ensure compliance with designated TSD facilities and on-Site WAC.

The release of hazardous and/or mixed hazardous waste from the Site to an off-Site waste management facility is accomplished by:

- identifying and meeting all applicable LDR standards;
- meeting all DOT requirements
- ensuring that the off-Site waste management facility meets the requirements of the CERCLA Off-Site Rule;
- using approved waste management vendors; and,
- meeting the receiving facility's WAC.

Under the "hazardous debris rule" provision, and in accordance with the debris treatment standards defined in 6 CCR 1007-3 Section 268.45, treated hazardous debris is exempted from the definition of hazardous waste, provided that the debris is treated to the performance or design and operation standards by an extraction or destruction technology, and the treated debris does not exhibit the characteristics of a hazardous waste. The exempted debris can be disposed in an industrial landfill (6 CCR 1007-3, Section 268, Subpart D) rather than a RCRA permitted landfill (6 CCR 1007-3, Section 268, Subtitle C). Note that these exemptions apply to disposal of certain low-level mixed wastes if they meet the receiving Site's WAC for hazardous debris.

7.0 COMPLIANCE WITH ARARs

As noted in Section 1.1, decontamination and decommissioning actions at RFETS must attain, to the maximum extent practicable, compliance with the substantive aspects of the Federal and State ARARs. The ARARs relating to this proposed action are identified in this section and summarized in Table 7-1. In addition, Table 7-1 identifies whether the requirement is applicable or relevant, and appropriate, or To-Be-Considered (TBC). Pursuant to RFCA ¶16, the procedural requirements to obtain federal, state, or local permits are waived as long as the substantive requirements that would have been imposed in the permit process are identified and explained (RFCA ¶17). The following discussion is intended to compliment other descriptions provided in the IM/IRA Plan in a manner that satisfies the RFCA permit waiver requirements.

Table 7-1. ARARs.

Action	Requirement	Prerequisite	Citation	ARAR
Air Quality	Compliance with air emissions	Control of emissions for smoke, particulate, and volatiles of concern. Implemented for construction activities, haul roads, haul trucks, demolition activities.	5 CCR 1001-3, Regulation 1 5 CCR 1001-9 Regulation 7	Applicable
	Compliance with NESHAP	Regulates radionuclide emissions from DOE facilities with a limit of 10 millirem per year (mrem/yr) Site standard.	40 CFR 61 Subpart H 5 CCR 1001-10 Regulation 8	Applicable
	Compliance with NAAQS	Maintain quality of ambient air for criteria pollutants.	5 CCR 1001-14	Applicable
	Compliance with Hazardous Air Pollutant Requirements	Implemented if the remedial action involves a specific, regulated pollutant.	5 CCR 1001-10 Regulation 8	Applicable
	Compliance with ozone depleting compound requirements	Ensure refrigerants are disposed of properly. Approved vessel recovery method must be used.	5 CCR 1001-19 Regulation 15	Applicable
Solid Waste	Solid Waste Disposal Act	Requirements for disposal of solid wastes.	6 CCR 1007-2	Applicable
TSCA	Disposal of PCBs	Ensure that any materials with >50 ppm PCBs are managed according to TSCA.	40 CFR Part 761	Applicable

Table 7-1. ARARs (continued).

Action	Requirement	Prerequisite	Citation	ARAR
Hazardous Waste	Compliance with Colorado Hazardous Waste Act	Identification and characterization of hazardous waste.	40 CFR 261 6 CCR 1007-3 Part 261	Applicable
Generator Standards	Standards Applicable to Generators of Hazardous Waste	Generator prepares a manifest if hazardous remediation wastes are disposed of off-Site.	40 CFR 262 6 CCR 1007-3 Part 262	Applicable
TSD Facility Standards	Temporary Unit Container and Tank Storage Requirements	Requirements for operation of temporary tank and container storage areas.	40 CFR 264.553 6 CCR 1007-3, Part 264.553	Applicable
Closure	Requirements for Closure of Permitted RCRA Units	Implemented if RCRA permitted units are closed.	40 CFR 264 6 CCR 1007-3, Part 264	Applicable
Closure	Requirements for Closure of RCRA Interim Status Units	Implemented if RCRA Interim Status Units are closed.	40 CFR 265 6 CCR 1007-3, Part 265 as provided in RFCA Attachment 10	Applicable
LDR	Treatment standards for hazardous waste	Requirements for treatment and land disposal of hazardous wastes.	40 CFR 268 6 CCR 1007-3, Part 268	Applicable
Universal Waste Management	Requirements for Universal Waste Management	Requirements for treatment and land disposal of hazardous waste.	40 CFR 273	Applicable
Used Oil Management	Requirements for Used Oil Management	Implemented if used oil is managed.	40 CFR 279	Applicable
Water	NPDES Requirements for discharging waste into surface water bodies	Requirements for discharge of stormwater or treated wastewater into surface water bodies.	40 CFR Parts 122 and 125 5 CCR 1002-8	Applicable
LLW Disposal	LLW Disposal	Requirements governing off-Site disposal of LLW.	10 CFR 61 6CCR 1007-14	Applicable
Radiation Protection	Standards for radiation protection	Establishes the criteria for the protection of human health and the environment.	DOE Order 5400.5	TBC
Radioactive Waste Management	Radioactive Waste Management	Requirements for the management and packaging of LLW.	DOE Order 5420.2A	TBC

7.1 Chemical-specific Requirements and Considerations

The project will encounter conditions regulated by the following chemical-specific restrictions. The restrictions will be incorporated into the project planning effort and will be assured by following site procedures or by direct inclusion in an IWCP.

Decommissioning has the potential to generate criteria, radionuclide, and Hazardous Air Pollutant emissions. The following Colorado Air Quality Control Commission Regulations serve as chemical specific applicable requirements:

- 5 CCR 1001-10, Regulation No. 8, Part A (40 CFR Part 61) Subpart H regulates radionuclide emissions other than radon from DOE facilities and will apply to the radiologically-contaminated portions of the 886 Cluster during decontamination and decommissioning. Section 61.92 establishes a Site radionuclide emission standard of 10 mrem/yr effective dose equivalent (EDE) to any member of the public. Section 61.93 mandates continuous radionuclide air emission monitoring for all points that have an estimated potential EDE to the nearest member of the public of greater than 0.1 mrem/yr, based on uncontrolled emissions. Section 61.96(b) requires that an application for approval and notification of start-up be filed with EPA and CDPHE for any new or modified source of radionuclide emissions if estimated controlled emissions from the source would cause the nearest member of the public to receive an EDE of 0.1 mrem/yr or greater. Preliminary estimates of the EDE resulting from controlled and uncontrolled emissions of radionuclides indicate that neither regulatory approval nor continuous radionuclide air monitoring will be required for the Building 886 decommissioning and demolition project. Radionuclide emissions from the project will be included in the Site radionuclide annual report.

- Regulation 8, Part C establishes an emission standard for lead in ambient air. The regulation states that no person shall cause or permit emissions of lead into the ambient air that would result in an ambient lead concentration exceeding 1.5 $\mu g/m^3$ averages over a one-month period. The regulation will apply to any decontamination or decommissioning activities with the potential to emit lead into the ambient air. Based on past experience with similar projects, the proposed activities are not likely to produce significant lead emissions that could exceed the ambient standard.

7.2 Action-specific Requirements and Considerations

7.2.1 Air

Decommissioning has the potential to generate particulate and fugitive dust emissions. 5 CCR 1001-3, Regulation No. 1, governs the opacity and particulate emissions. Regulation No. 1, Section II, addresses opacity and requires that stack emissions from fuel-fired equipment must not exceed 20 % opacity. Regulation No. 1, Section III addresses the control of particulate emissions. Fugitive particulate emissions will be generated from demolition and transport activities. Control methods for fugitive particulate emission should be practical, economically reasonable, and technologically feasible. During demolition activities dust minimization techniques such as water sprays, will be used to minimize suspension of particulates. In addition, demolition operations will not be conducted during periods of high wind. The substantive requirements will be incorporated into the area-specific work plans which will define the level of air monitoring and particulate control for the project.

5 CCR 1001-3, Regulation No. 3, provides authority to CDPHE to inventory emissions. Regulation No. 3, Part A, describes Air Pollutant Emission Notice (APEN) requirements. If applicable, RFETS will prepare an APEN to facilitate the CDPHE inventory process.

7.2.2 RCRA/CHWA/NPDES

7.2.2.1 Waste Storage - The waste generated during the decontamination and decommissioning activities governed by this IM/IRA are remediation wastes (See RFCA ¶25bf and RFCA Appendix 3, the Implementation Guidance Document). Remediation waste generated during this removal action will be evaluated consistent with the requirements of RCRA Part 261, Identification and Listing of Hazardous Waste, specifically Subparts A through C. Solid remediation waste will be generated and managed in accordance with the Colorado Solid Waste Disposal requirements, 6 CCR 1007-2. In addition, sections of Part 268, LDRs applicable to off-site shipment and disposal of hazardous waste are ARAR.

If necessary, remediation waste will be temporarily managed in a configuration which meets the substantive requirements of section 264.533 for management of TUs. The requirements governing TUs are applicable to tanks and containers used for storage and treatment of hazardous remediation wastes generated in conjunction with the decontamination and decommissioning activities (See 40 CFR 264.553). All tanks and containers will be compatible with the waste and in good condition. Incompatible wastes, if encountered, will be segregated within the units. Secondary containment will be provided, as appropriate, if liquid wastes are stored or treated in tanks or containers. Waste characterization will be provided, as appropriate, in accordance with Waste Management Plan. Inspections, at a minimum of once a week, will be provided during operations in accordance with the Waste Management Plan. Training for individuals generating and handling waste will be implemented using the framework identified in the RFETS Part B permit. To close a TU, waste and contaminated soils will be removed, as appropriate. The information in this paragraph is provided to satisfy the permit waiver conditions in RFCA ¶17.

7.2.2.2 Waste treatment - Any waste, soil/waste mixture, debris, liquid, or remediation waste that is identified as a hazardous waste requires treatment to the LDR treatment levels for wastewater or non-wastewaters, as appropriate, prior to disposal. (See 40 CFR 268.40, Treatment Standards for Hazardous Wastes) prior to disposal. Solidification of characteristic hazardous remediation wastes may be conducted within a TU. For example, scabbling of low level, RCRA characteristic lead-based paint may result in a remediation waste form amenable to solidification. The solidification would be conducted within competent tanks or containers and subject to waste analysis requirements imposed by the waste management plan. The information in this paragraph is provided to satisfy the permit waiver conditions in RFCA ¶17.

7.2.2.3 Debris treatment - Where appropriate, the project decontamination pad or the sitewide decontamination facility will be configured to perform low-level, hazardous, or mixed waste debris treatment in accordance with 40 CFR 262.34, 268.7(a)(4) and 268.45. The information in this paragraph is provided to satisfy the permit waiver conditions in RFCA ¶17.

Solid residues from the treatment of debris containing listed hazardous wastes are subject to RCRA hazardous waste management ARARs as are any solid residues from debris treatment that exhibit a hazardous waste characteristic.

Liquid residues from the treatment of debris containing listed hazardous wastes are subject to RCRA hazardous waste management ARARs until they are placed into the Consolidated Water Treatment Facility (CWTF) headworks.

Liquid residues from the treatment of debris containing listed hazardous wastes are subject to RCRA hazardous waste management ARARs until they are placed into the Consolidated Water Treatment Facility (CWTF) headworks. Any building residues that result from the treatment of listed debris will carry the same listing as the listed debris from which it originates. Any CWTF treatment residues that exhibit a hazardous waste characteristic will also be managed in accordance with RCRA hazardous waste management ARARs. Alternatively, liquid residues that meet acceptance criteria may also be treated in Building 374 or the sewage treatment plant in compliance with the RCRA and National Pollutant Discharge Elimination System (NPDES) permits.

7.2.2.4 Wastewater treatment - Remediation wastewaters generated during decontamination and decommissioning will be transferred to the CWTF (Building 891) for treatment. Remediation wastewaters that contain listed RCRA hazardous wastes or exhibit a RCRA characteristic will not be subject to compliance with RCRA hazardous waste codes and these requirements would not be ARAR because the wastewaters are CERCLA remediation wastes being treated in a CERCLA treatment unit. The CWTF will treat the remediation wastewaters to meet applicable surface water quality standards under a NPDES ARARs framework. Waste generated at the CWTF will also be evaluated for hazardous characteristics. The information in this paragraph is being provided to satisfy the permit waiver conditions in RFCA ¶17.

7.2.3 Toxic Substances Control Act

TSCA defines criteria to guide management and disposal of PCBs. Fluorescent light ballasts, a gasket in Room 111, purple (light and dark) paint from HEUN lines, green paint with brownish/red base coat on electrical utility boxes, and potentially oil in the hydraulic pump for the horizontal split table in Building 886, Room 101 are the sources of PCBs in the cluster. Any other materials, if identified through in-process characterization during decontamination and decommissioning as suspected of containing PCBs will be managed in accordance with 40 CFR Part 761, Disposal of PCBs, if determined to contain >50 ppm PCBs.

Light ballasts marked "No PCBs" or "PCB free" will be managed as solid waste and disposed at a sanitary landfill. Ballasts marked "PCBs" or not marked and not leaking will be packaged for disposal at a TSCA-permitted facility. Leaking PCB light ballasts and unmarked light ballasts will be managed as fully-regulated PCB articles.

7.3 Location Specific Requirements and Considerations

No location specific requirements are associated with this action.

7.4 Requirements To-Be-Considered

Due to the radiological contamination in the 886 Cluster, guidelines contained in DOE Order 5400.5 are identified as TBC. DOE Order 5400.5 will be followed in areas known to be radiologically contaminated to ensure the protection of the workers, public, environment. In addition, DOE Order 5420.2A, "Radioactive Waste Management," is also identified as TBC and contains the requirements for the management and packaging of LLW.

8.0 Environmental Consequences of the Proposed Action

The National Environmental Policy Act (NEPA) requires that actions conducted at the RFETS consider potential impacts to the environment. The Memorandum of Secretarial Officers and Heads of Field Elements, dated June 13, 1994, issued by the Secretary of Energy, Hazel O'Leary and entitled "The National Environmental Policy Act Policy Statement" defines the DOE policy for integrating the NEPA process into the CERCLA decision making process. While no separate NEPA documentation is required for this effort, RFCA (and DOE policy) requires DOE to consider environmental impacts of the proposed action and of alternatives as part of this document.

The proposed decontamination and decommissioning activities for the 886 Cluster involve dismantling activities such as disconnection of electrical power, disassembling of equipment, further decontamination (if deemed necessary) in the area-specific work plans, and demolition of facilities. Decommissioning of the tunnel connecting Buildings 886 and 875, the subsurface portion of Building 875, and Building 828 may require sub-grade demolition or stabilization.

Given the existing environmental and industrial setting of the 886 Cluster, environmental impact issues associated with the proposed decontamination and decommissioning activities for the 886 Cluster are limited in scope. Many of these activities are categorical exclusions under DOE's NEPA regulations (i.e., demolition/disposal of facilities; disconnection of utilities; reducing surface contamination). Activities are not anticipated to have direct or indirect, or irreversible and irretrievable impacts to natural resources at RFETS and ultimately will improve natural resources. The proposed activities are unlikely to result in discernible adverse effects to biological resources, including vegetation, wetlands, wildlife habitat, and state or federal sensitive (e.g., threatened or endangered) species populations or habitat. The facilities to be decommissioned are not located on a floodplain and the proposed activities will not affect, or be affected by, any floodplain. No wild and scenic rivers, prime agricultural soils, parks or conservation areas, or natural resources will be affected. The proposed activities will provide employment for a very small number of people, most of who are expected to come from the current Site work force; as a result, the activities are also unlikely to result in adverse socioeconomic effects. Therefore, the discussion of environmental impact issues focuses on the following areas of potential impacts:

- Mobilization of radioactive and other contaminants into the environment via soils, air, surface waters, or groundwater;

- Health and safety of workers who may be exposed to radioactive and toxic or hazardous materials (including lead and PCBs), and health and safety of the public, both during normal decontamination and decommissioning activities as well as accidents;

- Environmental issues associated with waste management, including the contribution of wastes generated by the proposed activities to the decreasing site-wide capacity for interim storage and transportation of waste;

- The physical removal of Building 886 as a historic structure that is eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities at Rocky Flats; and

- The project's contribution to site-wide cumulative impacts.

8.1 Geology and Soils

The decommissioning of the 886 Cluster will disturb minor land acreage, most of which has been previously disturbed. Decommissioning of the tunnel and subsurface structure associated with Building 875 and Building 828 can be accomplished by either stabilizing the structures and backfilling, excavation and backfilling, or some combination thereof. Additionally, some re-contouring of the soils will likely be necessary after facilities are removed to restore soil in areas disturbed by demolition equipment. Disturbed soils will be re-vegetated as necessary to avoid soil erosion. Contamination of soils from decommissioning activities is not expected because facility structures will be decontaminated or fixed prior to demolition of the structures themselves.

8.2 Air Quality

Potential impacts to air quality resulting from the decontamination and decommissioning of the 886 Cluster facilities include radionuclide emissions resulting from the dismantlement and removal of equipment and fugitive dust emissions resulting from demolition and transportation activities. Air emissions from these activities will be controlled and monitored in accordance with the RFETS Health and Safety Practices Manual and project-specific particulate control plans. The sources of PCBs within the cluster are a gasket in Building 886, Room 111, purple (light and dark) paint from HEUN lines, green paint with brownish/red base coat on electrical utility boxes, potentially oil in the hydraulic pump for the horizontal split table in Building 886, Room 101, and light ballasts. In general, cleanup and removal of materials and equipment contaminated with PCBs has a very small potential to cause a release to air. Management of the contaminated materials and equipment in accordance with current Site procedures will result in minimal risk personnel.

Decontamination, dismantlement, and demolition activities in the 886 cluster have the potential to release radionuclides to the air. Decontamination and dismantlement activities take place within the room and the room exhaust is equipped with high efficiency particulate air (HEPA) filters. This essentially eliminates the potential for a radionuclide release short of an accident during the transportation of the contaminated materials. Stack monitoring is also conducted to ensure the integrity of the HEPA filtration equipment. Fugitive dust emissions will result from the transportation of materials and wastes from the 886 Cluster and sub-grade demolition and subsequent re-grading associated with site reclamation phase of decommissioning. Mitigative measures will be taken to minimize the potential for short-term fugitive dust emission during the demolition of the structures. Heavy equipment will be used to reduce the cluster facilities; however, because of the distance of the 886 Cluster from Site boundaries, the short-term impacts are limited to personnel working in areas proximate to the Cluster. Additionally, miscellaneous hazardous materials will be removed from several structures within the 886 Cluster. These materials will be managed in accordance with existing, Site procedures and there will be little risk for air emissions.

8.3 Water Quality

Because decommissioning of the 886 Cluster will potentially remove portions of structures below ground level and soils under building foundations will be exposed, silt fencing or similar protective devices may be installed to prevent or minimize the possibility of water-borne soil leaving the immediate area and entering drainage ways. Demolition activities may, however, deposit small amounts of debris on the surrounding pavement or ground surface that could be carried away by storm water runoff. Quantities of such material are expected to be small. Soil exposed after building foundations are demolished and subsurface decontamination and decommissioning activities (i.e., 875 tunnel, the subsurface 875 structure, and the Building 828) are not expected to impact storm water runoff, storm water percolation, or surface water flow characteristics. Demolition activities will be performed after the structures have been decontaminated. Soil verification samples will be collected to ensure contamination, if present, is below RFCA Tier I Subsurface Soil Action Levels prior to the site reclamation phase of decommissioning.

Among the techniques that may be used for decontamination of the 886 Cluster is the use of water or steam to remove contamination and loose debris. While this technique is effective in removing contamination, it also generates large volumes of potentially contaminated water and may even contribute to the potential spread of contamination. Surface water samples from the 886 Cluster drainage sub-basin will be collected using an automated station location to collect samples from the entire sub-basin's runoff. If water is generated from decontamination it will be treated prior to release, if required.

Decontamination activities associated with the 875 tunnel, the subsurface 875 structure, and the Building 828 are not expected to impact groundwater. Demolition will be performed after the structures have been decontaminated. Soil verification samples will be collected to ensure contamination, if present, is below RFCA Tier I Subsurface Soil Action Levels.

8.4 Human Health Impacts

Decontamination and decommissioning has the potential to expose project workers, non-project workers, and the public to radiological and other contamination. Disruption of contaminants or hazardous materials increases the chance of the contaminant or materials being dislodged, becoming airborne, and being inhaled by or deposited on humans.

8.4.1 Radiological Impacts

For project workers, deactivation and decontamination activities for the 886 Cluster are estimated to result in a total dose of 0.4 person-rem. This exposure would be expected to result in less than 1 (2×10^{-4}) latent cancer fatalities, assuming the same worker group conducted both the deactivation and the decontamination activities. Doses to co-located workers from decontamination and decommissioning operations for the 886 Cluster alone have not been evaluated. However, the annual radiological exposure of a maximally exposure co-located (unprotected) worker as a result of Site-wide closure activities is estimated at 5.4 mrem. The corresponding risk of a latent cancer fatality to this worker is 2 in 1,000,000 (DOE 1997b).

Annual dose to the maximally exposed off-Site individual from Site-wide closure activities is estimated at 0.23 mrem, with a corresponding excess latent cancer fatality of 1 in 10,000,000. The annual dose to the public resulting from all activities in the RFETS closure project, at the peak time of exposure (1997 - 2006), is expected to be 23 person-rem, or a total of 23 rem, for all of the 2.7 million people projected to be living within 50 miles of the Site in 2006. This annual dose of 23 person-rem would be expected to result in less than one (0.01) latent cancer fatality in the entire Denver area population. Estimated annual dose to the maximally exposed off-Site individual is well below the applicable standard of 10 mrem/yr (DOE 1997b).

Estimated doses from the 886 Cluster project are expected to be a small fraction of those estimates for Site-wide activities, as described above. For comparison purposes, DOE's annual limit for occupational exposure as a result of all exposure pathways is 5,000 mrem per person. The Site standard for annual exposure is 750 mrem per person.

Natural background radiation in the Denver area results in an annual exposure of approximately 350 mrem per person.

Exposures to workers and the public will be controlled and monitored in accordance with the RFETS Radiation Control Manual.

8.4.2 Non-Radiological Impacts

Non-radiological health affects (from exposure to chemicals) are measured by a hazard index. A hazard index greater than one is considered the basis from concern. For the full suite of Site closure activities (including decommissioning of all facilities), a hazard index of 1.2 has been calculated for a co-located worker who is chronically exposed to all chemicals of concern simultaneously during working hours over the entire period of Site closure. The corresponding cancer risk is 5 in 100,000 (DOE 1997b).

For the full suite of Site closure activities (including decommissioning of all facilities), a hazard index of 1.5 has been calculated for a member of the public who is chronically exposed every day for 70 yrs to all chemicals of concern simultaneously (a highly unlikely event). A more reasonable scenario of exposure to a single chemical showed hazard indices of well below one for each potentially released chemical; analysis of potentially carcinogenic air pollutants indicates a cancer risk of 3 in 10,000,000 for the maximally exposed off Site individual (DOE 1997b).

Estimated non-radiological impacts from the 886 Cluster decommissioning are expected to be a small fraction of those estimates for Site-wide activities, as described above. Exposures to workers and the public will be controlled and monitored in accordance with the RFETS HSP Manual.

8.4.3 Occupational Hazards

In addition to exposure to radiological and chemical hazards, workers at the Site are expected to be exposed to a variety of industrial hazards such as heavy machinery, repetitive motion tasks, and physical agents such as heat and cold. Using a general industry standard for construction to estimate injury and illness cases, Site closure activities are estimated to result in 584 cases of injury and illness during the peak activities period (1997 - 2006) (DOE 1997b). The contribution of these cases which would be estimated to result from the 886 Cluster project alone would be less than the total Site estimate.

The general industry rate of injury and illness is considerably higher than the historic incidence rate for the Site; occupational hazards will be controlled, mitigated, and monitored in accordance with the RFETS HSP Manual.

8.5 Plants and Animals

Because the 886 Cluster is located in the previously disturbed IA, impacts to plants and animals are expected to be minimal. Possible minor impacts to other vegetative areas may be distribution of fugitive dust containing undesirable materials among plant species. Additional impacts may occur in vegetation associated with increased traffic in order to accommodate the decommissioning equipment. Increased traffic, both vehicular and pedestrian, could result in some vegetation disturbance.

Mammals such as rats, mice, and raccoons are known to be residents of or visitors to the IA. Additionally, cats reside under T886A. These mammals would be displaced, and some mortality would likely occur as a result of decommissioning activities. Bird nests attached to facilities planned for demolition would be destroyed, although no direct bird mortality is anticipated. The Preble's Meadow Jumping mouse, a species proposed for listing as endangered, is known to exist in downstream areas of the 886 Cluster. The 886 Cluster activities will not be performed in known Preble's Jumping Mouse habitat.

8.5 Environmental Issues Associated with Waste Management

Environmental impact issues associated with waste management are related to human health issues, storage capacities, and transportation.

In general, waste generated from decontamination and decommissioning the 886 Cluster includes contaminated and uncontaminated equipment, tools, electrical conduit systems, piping systems, gloveboxes, and facility structural materials. Decommissioning the 886 Cluster will generate waste as tentatively estimated in Section 6.0.

Decontamination will be performed as necessary to remove radiological contamination and hazardous constituents. Where feasible and whenever possible items will be decontaminated to unrestricted release conditions. Items that have been decontaminated to a unrestricted release condition will be transferred to for use at a different location within RFETS, for use at a different DOE facility, or sent to the PU&D organization for appropriate disposition. Mixed waste generated from decontamination and decommissioning activities will be stored on-Site, and where feasible, shipped to an approved off-Site disposal facility. Hazardous wastes will be managed as waste, where applicable, and disposed in accordance with established procedures. Materials and waste will be characterized, stored, and disposed in accordance with 886 Cluster ARARs.

Waste minimization will be used in the planning and management of the 886 Cluster decontamination and decommissioning wastes. Elimination and reduction of waste generated as a result of decontamination and decommissioning is a high priority. Decontamination options will be evaluated for waste minimization potential and suitable minimization techniques will be implemented (Section 6.0).

With respect to transportation of waste, the 886 Cluster project would generate and package materials suitable to meet DOT transportation requirements (Section 6.0).

8.6 Historic Resources

The environmental impact issue related to historic resources is the loss of Building 886 as a historic structure eligible for the National Register of Historic Places and as a primary contributor to a potential Historic District of Cold War Era facilities. A related cumulative impacts discussion is in Section 8.10.

Sixty-four facilities within the IA, including Building 886 have been identified as important to the historic role of the Site in manufacturing nuclear weapons components during the Cold War. While this facility is less than 50 yrs old, one of the usual criteria for determining eligibility is that it is considered historically significant as an essential component of the weapons production activities at Rocky Flats.

The agreement between DOE and the State Historic Preservation Officer concerning the appropriate mitigative measures applicable to these facilities has been completed; rooms within Building 886 were photographed and the facility was described. Drawings and blueprints were collected. The documentation requirements for Building 886 were completed and accepted (National Park Service [NPS] 1997).

The demolition of the 886 Cluster is in support of the Site Mission and is covered under the Atomic Energy Act.

8.7 Noise

Decontamination and decommissioning of the 886 cluster is not expected to significantly increase noise levels in the Rocky Flats area. Most activities will take place inside the associated facilities so that noise levels, if elevated over ambient levels, will be confined to the 886 Cluster structures in which they are generated. Other less common activities such as scabbling (use of a machine to remove layers of concrete), blasting (use of various materials such as sand, dry ices, or other abrasives to remove superficial contamination), and demolition by backhoe ram, hydraulic cutters, or other devices are expected to generate noise levels higher than ambient levels; however, worker involved in those activities will use appropriate hearing protection devices during activities expected to generate such levels. Outdoor activities will take place at a distance from unprotected workers and the public and thus are not expected to increase noise levels to these populations to an unsafe level.

8.8 Socioeconomic Effects

Potential impacts from the decontamination and decommissioning of the 886 Cluster would contribute to a net overall loss of employment. The current on-Site work force in the facility would either be drawn into the D&D activities for the facility (and potentially for the entire Site) or voluntarily lose employment. In the short term, the decontamination and decommissioning activities could increase the employment level due to increased work force levels associated with the cluster activities . Additionally, in the short term, a modest increase of purchases (raw materials) may result due to the decontamination and decommissioning activities.

Under a hypothetical worse case scenario, if the entire work force currently housed in the 886 Cluster all opted for voluntary separation, the net overall impact would not have a great adverse effect on the Denver Metropolitan area nor would it adversely effect Boulder and Jefferson Counties, where the majority of the work force reside. Taken as a single facility, the net effects are expected to be minimal.

8.9 Cumulative Effects

Impacts associated with the decontamination and decommissioning of the 886 Cluster would eventually contribute incrementally to potential Site-wide cumulative impacts attributed to the overall Site closure program. Some of these cumulative impacts may ultimately prove to be beneficial to the environment, assuming that the activities result, as expected, in the restoration of much of the Site's original, natural condition prior to construction. Removing human occupation, structures, and paved surfaces and re-establishing native grasses and other vegetation could restore native plant communities and increase wild life habitat, including threatened and endangered species. Cleaning up contamination will reduce health risks to human and animal populations.

As with decontamination and decommissioning of the 886 Cluster, Site-wide decontamination and decommissioning of structures will generate low-level, low-level mixed waste, and industrial (landfill) waste. Existing, interim storage for radioactive waste is limited on-Site (DOE/EA-1146), and eventually, as Site-wide decommissioning progresses, additional storage capacity may be needed. The same is true for industrial waste; the existing landfill is nearing capacity and is scheduled for closure under the Site restoration program in 2006. All sanitary landfill waste will be transported and disposed at an off-Site landfill.

Also demolition of the 886 Cluster is part of a potential cumulative effect to historic resources. Demolition will result in the physical removal of an historic structure that is eligible for the National Register of Historic Places and primary contributor to a potential Historic District comprised of Cold War Era facilities. Other historic structures within this district are also proposed for decommissioning. The cumulative effect of these removals may be significant. The landscape would take on a less industrial and more open, rural appearance, similar to the rangeland that characterized the area prior to the plant was constructed.

8.10 Mitigation Measures

Mitigation measures are prescribed to reduce or avoid potentially adverse effects associated with a proposed activity. For the decontamination and decommissioning of the 886 Cluster, mitigation measures will be considered in the areas of human health, worker safety, release of emissions, and mobilization of contaminants, and cultural resources.

Decontamination and decommissioning will be conducted in accordance with applicable worker and public health and safety programs; activities will be managed so that emissions and discharges are within applicable regulatory limits. As required, decontamination and decommissioning will occur within containment of existing facilities or temporarily constructed facilities (e.g. tents) with fluctuating drainage, air filtration, and other safety and environmental protection systems commensurate with risks inherent in the activities being conducted.

A runoff management plan will be developed and implemented to avoid contamination of groundwater or surface water.

If, during demolition activities, groundwater is encountered, the water will be characterized for contaminants and a determination of its acceptability for discharge obtained.

Precautions will be taken to ensure compliance with the Migratory Bird Act which prohibits destruction of birds or their nests, active or inactive, without a permit. Building surveys for such nests in the 886 Cluster will be conducted prior to demolition and activities will not be initiated until results of the survey have been approved by site ecologists and any required mitigative actions taken.

Activities will be applied, as appropriate, to ensure protection of the Preble's Meadow Jumping mouse as follows:

- Containment of any potential contamination (chemical and radiological) associated with decontamination and decommissioning such that this contamination cannot enter waterways.
- Placement of silt fencing downstream/downhill of any excavation of soil disturbance and construction of diversion ditches and sumps to contain contaminated sediment.

Facilities determined to be eligible for the National Register of Historic Places will not be modified or damaged prior to completion of documentation according to standards set forth in the programmatic agreement among the DOE/Rocky

Flats Field Office, the Colorado State Historic Preservation Office and the Advisory Council on Historic Preservation Office and the Advisory Council on Historic Preservation.

8.11 Unavoidable Adverse Effects

The 886 Cluster decontamination and decommissioning activities, if conducted as proposed, will have the following unavoidable adverse effects:

- Physical removal of an historic structure that is eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities;

- Short-term increases in contaminant concentrations in air emissions and water discharges;

- Improbable but potential radiation and chemical exposures to workers, co-located workers, and the public, resulting in a small, but increased risk of adverse health effects;

- Possible industrial accidents, resulting in injury and illness; and,

- Increased noise levels for the duration of decontamination and decommissioning activities.

8.12 Short-Term Uses and Long-Term Productivity

Unlike most projects which commit a Site to a particular use for a period of time, the effect of decontamination and decommissioning will be to undo past commitments concerning use of the Site and open up a new broad range of potential future uses. Decommissioning does not commit the Site to a particular land use, rather, decommissioning of the 886 Cluster will be one step in the process of ending one use and opening consideration for a variety of other possible future short- and long-term uses.

8.13 Irreversible and Irretrievable Commitments of Resources

Decontamination and decommissioning is essentially a destruction project eliminating existing uses, not a construction project consuming land and building materials. Decontamination and decommissioning of the 886 Cluster will release land and perhaps some facilities for other uses. Funds, labor, equipment, fuel, tools, personal protective equipment, waste storage drums, and similar items are resources that will be irretrievably committed to the decontamination and decommissioning project. There are no anticipated irreversible or irretrievable commitments of natural resources as a result of the proposed action.

9.0 IMPLEMENTATION SCHEDULE

The decontamination and decommissioning of the 886 Cluster will require 18 months to complete. This proposed schedule is subject to change due to regulatory and public concerns, budgetary constraints, weather delays, etc.

10.0 PROJECT ORGANIZATION

The project organization is presented in Figure 10-1 and shows the responsible project personnel, subcontractors and plant support contacts. Roles and responsibilities for the project are also described in the HASP (RMRS et al., 1997). RMRS and SSOC have teamed to plan and manage the project. Support will be coordinated for the decontamination and decommissioning through the appropriate RFETS contractor or subcontractor. Access control to the area will be in accordance with the HASP.

10.1 Integrated Safety Management

Enhanced Work Planning (EWP) is the natural implementing vehicle to involve workers, and to incorporate the five key elements of the Defense Nuclear Facility Safety Board recommendation 95-2. These key elements -- work scope reviewed and prioritized; work scope analyzed for hazards and categorized based on risk; controls established based on hazards, risk, and experience of workers; work performed safely, efficiently, with appropriate degree of supervision; and continuous improvement and lessons learned -- encompass the essence of an effective, efficient, and safety conscience work process. EWP also serves as a tool to implement the ISM process. The ISM process integrates safety into management and work practices at all levels.

As stated in Section 4, the ISM process will be implemented that is structured around five core principles (1) define the scope of work, (2) analyze hazards, (3) develop and implement controls, (4) perform work within controls, and (5) provide feedback and continuous improvement. The process will facilitate work by identifying key hazards up front and incorporating risk management into the job planning process. ISM combines a diverse group of people and risk graded infrastructure programs to satisfy the multiple safety environmental and health needs uniformly. In this process, lower risk activities would be considered Routine Work, with a basic IWCP, and no Activity Control Envelope (ACE) required for safe completion of the work. On the other end of the spectrum, more complex, high risk work would require the preparation of an ACE as well as some manner of demonstrating readiness for this activity. Routine work would encompass activities such as removal of lighting, elimination of furniture, cleaning of floors for RCRA closure, etc. High Risk work would encompass activities such as glovebox removal, strip-out of plenums, etc.

The area-specific work plan development and IWCP process has been combined to develop work instructions for the 886 Cluster decontamination and decommissioning. Based on input from the project team, walk-downs, characterization data and applicable building documents, area-specific work plans will be developed for each work area. The area-specific work plans will contain detailed work instructions for all the closure activities. The work plans will include engineered radiation controls, health & safety practices, and waste management requirements, in addition to the decontamination, disassembly, and size reduction instructions. Work instructions will be written such that they can be used directly as the IWCP.

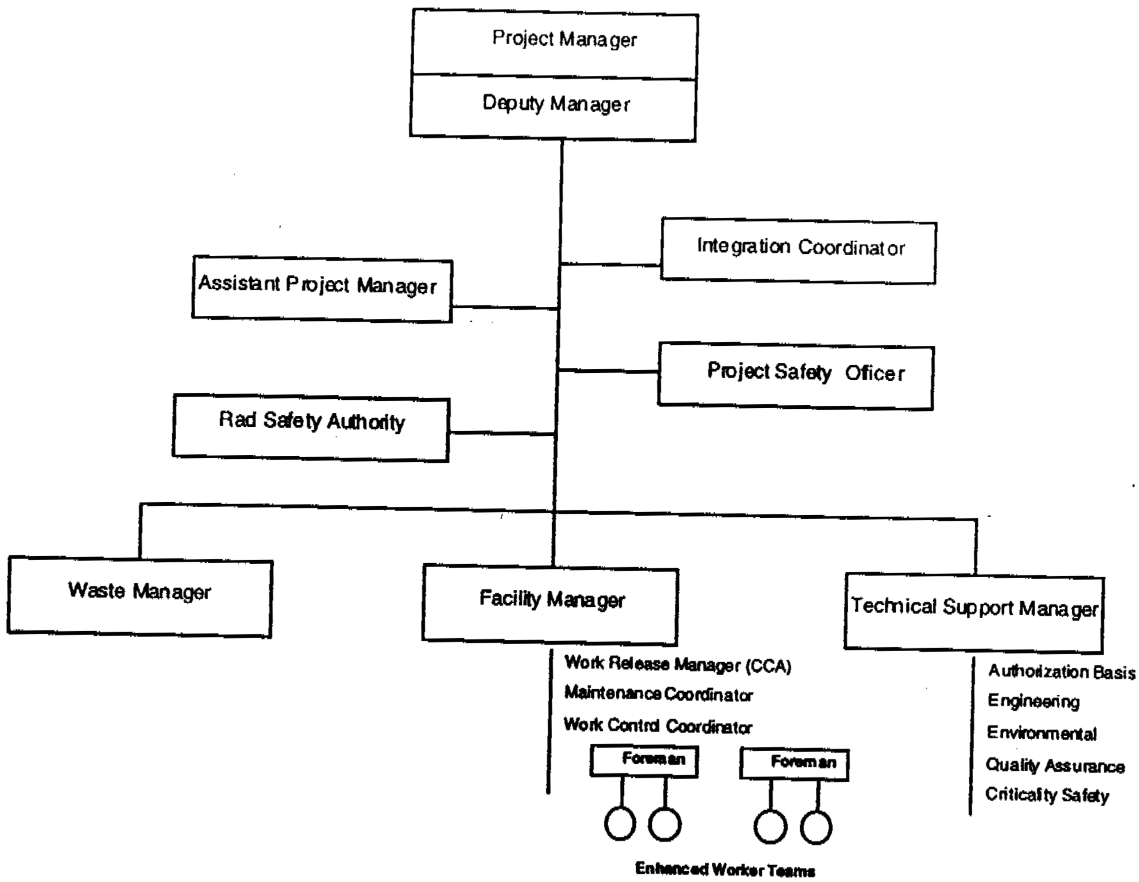
10.2 Quality Assurance

A commitment to program quality and continuous improvement is applied at all levels from project start through project completion. Adherence to the commitment is instrumental in the success of the project. All project personnel are responsible for following approved quality assurance (QA) program requirements and participating in quality improvement activities.

QA/quality control (QC) personnel are involved at the initial planning stages of the project, during site preparation, and during project execution. The QA Organization assumes a proactive role during the project by identifying and/or preventing potential problems or shortcomings; offering solutions; and assisting in corrective action steps. QA personnel administer and perform duties in accordance with approved QA program requirements. The scope of the QA/QC programs ensures:

- consistency and effective implementation of management/DOE directions and policies with other project/DOE requirements through audits and surveillance;
- assurance of document review and approval requirements through review of applicable procurement and work documents;
- validity of data gathering methodologies;
- compliance with standard operating procedures;
- integrity of waste packaging and incoming materials through inspections;
- facility characterization through performance of facility walk-downs;
- initiation of monitoring projects for potential improvements; and,
- emplacement of corrective action initiatives.

Figure 10-1. Organizational Chart



11.0 RESPONSIVENESS SUMMARY

Comments and questions raised on the IM/IRA Plan during the comment period are summarized briefly below. The comment period was held from xxxx to xxxx. Many of the questions were answered at the public meeting as reflected in the transcripts in the Administrative Record file. Comments and questions on the IM/IRA Plan, submitted during the formal comment period, including those provided during the public meetings are categorized below along with the response.

12.0 REFERENCES

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